

connecting tube for connecting the inner liquid receiving plate with the open end of the feed tube of the other element, v) a permeate-liquid outlet facing the open end of the hollow fibers of each element and extending through the container wall, and vi) a non-permeated fluid discharge outlet located as opposed to the outer surface of the other element and extending through the container wall in communication with the space and the outside of the container wall, and

further wherein the container comprises a cylindrical pressure vessel, and the distance d between the centerline of the discharge outlet and one end of the cylindrical pressure vessel is in the range of 0.1 m to 0.6 m.

REMARKS

Favorable reconsideration of the subject application, as amended above, is respectfully requested in view of the comments below.

Upon entrance of this Amendment, claims 1-2 will be pending in the present application. Claims 1 and 2 have been amended to more particularly define the claimed invention by incorporating the subject matter of claims 3 and 4 respectively. In particular, each of the claims has been amended to clearly define the distance d, which is the distance between the end of the cylindrical pressure vessel and the centerline of the discharge outlet. Support for this amendment is found on page 12 of the originally filed specification.

Applicants have also amended the specification in order to clarify an inadvertent translation error. The word "affusion" and "a brackish water" are both pronounced "kan-sui" in Japanese. Therefore, there was an error in the translation, which Applicants have now corrected. As is evident from the description within the specification on page 1 and in Examples 1-(1) and 1-(2) on pages 16-17, reverse osmosis membranes are being used and the "affusion" used in the specification is in fact a brackish water, e.g. saline water.

In addition to the specification and claims, Applicants have included with this Amendment, a Request for Corrected Drawings. As can be seen in the amended Figures 1

and 2, the extension line indicating the distance d has been amended to conform with the description on page 12 of the originally filed specification. The extension line d , represents the distance between the end of the cylindrical pressure vessel and the centerline of the discharge outlet. As is discussed on page 12, if the distance d exceeds 0.6 m, it is hard to purge suspended materials because too large a dead space is generated. It is apparent from this description that the extension line of the distance d set at the outer end surface of the end plate 10' is improper since the distance d would change depending on the difference of the plate thickness of the end plate 10' even when the dead space is not changed.

The amendments to the specification and claims do not add new matter and do not raise issues requiring further searching. These amendments are made merely to place the application in condition for allowance. In particular, the amendments to the claims are made in response to the Examiner's comments on page 2 of the Office Action. Therefore, it is respectfully requested that the amendments be entered and the Declaration enclosed herewith be considered at this time.

I. Rejection of Claims 1-4 Under 35 U.S.C. §103(a)

Claims 1-4 are rejected under 35 U.S.C. §103(a) as being unpatentably obvious over the '958 application in combination with Sekino et al. and Ethiene et al. The Examiner applies the same rejection as found in the Office Action dated March 15, 1999, but now includes claim 1. The Examiner indicates that "Sekino et al. discloses the retentate outlet in communication with the gap and the outside of the container wall, and fails to disclose the location as opposed to the outer surface of each element" and that the "location of the retentate outlet at the end of the container and opposed to the fiber bundle and extending through the container, for removing retentate from the gap between the fibers and the container wall is conventional in the art." Therefore, the Examiner contends that it would have been obvious to one skilled in the pertinent art to move the outlet to any other position with respect to the housing wall.

This rejection is respectfully traversed as follows.

The present invention enables high performance desalination by limiting the position of

the discharge outlet to a predetermined range. The claimed permselective membrane modules, comprises a discharge outlet for a non-permeate fluid in one side of the cylindrical pressure vessel including a distance d between the end of the cylindrical pressure vessel and the centerline of the non-permeated fluid discharge outlet, which is in the range of 0.1 m to 0.6 m. This range allows for adequate amounts of permeated flux to be obtained, high salt removal rates, and no deposition of scales. If the distance d exceeds 0.6 m, too large a dead space is generated, which causes the salts contained in the non-permeated fluid to form scales. This in turn results in a rapid decline of desalination performance. These events are apparent from the result of Experiment 1 included within the Declaration filed with this Amendment. The Declaration is by Mikio Katsube, one of the inventors and shows the results of an experiment to evaluate the separation performance of the membrane modules using different d distances.

In contrast, as the Examiner indicated, neither WO 93.07958 nor Sekino et al. teach the location of the retentate outlet. Furthermore the discharge outlet of Ethiene et al. is for a permeate fluid containing no suspended materials and, therefore, there is no deposition of scales, regardless of the position of the discharge outlet in the vessel. As for Ohmori et al., it discloses a blood dialyzer. The discharge outlet found in Ohmori et al. is for the blood after dialysis whose salt concentration is so much lower than that of the non-permeated fluid after permeation in the apparatus of the present invention, that scales hardly deposit.

Therefore, the combined prior art fails to disclose or suggest the present apparatus and in particular, fails to disclose or suggest the relationship between the position of the discharge outlet and the decline of desalination performance caused by the deposition of scales. Applicants have recognized these problems associated with permselective membrane modules and have resolved the problems in the claimed invention. As such, the present invention, as set forth in claims 1-2 is not obvious over the combined cited art.

Accordingly, the rejection of claims 1-4 under 35 U.S.C. §103(a) over the '958 application in combination with Sekino et al. and Ethiene et al. is respectfully traversed.

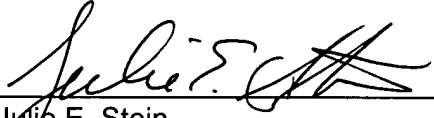
It is respectfully submitted that the present invention, as amended above, is in condition

for allowance, an early notification thereof being earnestly solicited.

The Commissioner is authorized to charge any fees relevant to this filing to Deposit
Account 11-0600.

Respectfully submitted,

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